

are truly given off by the fibre, and are not merely coagula, I have not yet been able to determine.

In transverse sections a definite sheath to the fibre can be seen, although the fibre itself is not readily made out in these sections until a certain familiarity with its course has first been obtained from an examination of sagittal sections. In the one fibre measured, the diameter was a little more than $6\ \mu$.

I did not find in any of my preparations that the fibre curled up into the "tangle" or "snarl" as described by Sanders in *Myxine*, by Dendy in *Geotria*, and mentioned by Sargent as commonly occurring, but this may probably be attributed to the precaution that was taken in every case thoroughly to fix and harden the central nervous system before severing the spinal cord. (The brain and spinal cord of several of the smaller specimens were cut entire in sagittal sections.) In all cases the central nervous system was dissected out entire from the freshly killed animal, and, where practicable, under the actual preserving fluid. Zenker's fluid, which did not admit of this, gave less satisfactory results than Flemming's stronger fluid. The stain employed was a modification of Weigert's suggested by C. Judson Herrick.

I have compared the fibre seen in sections so prepared with that shown in sections of *Petromyzon fluviatilis* in the laboratory collection at King's College, and also with that shown in Prof. Dendy's *Geotria* sections, which were prepared by altogether different methods, and the comparison leaves no doubt in my mind that we have here to do with a perfectly normal structure, and one cannot but express wonder that an object so clearly defined should have for so long escaped notice in the frog.

GEORGE E. NICHOLLS.

King's College, London, February 6.

Rhynchobdella aculeata in Ceylon.

It seems worth while to make a special note of the occurrence of the above-named food-fish in the inland waters of Ceylon. Its near ally, *Mastacembelus armatus*, has long been known to occur here. The general Ceylonese term for fishes belonging to the family Rhynchobdellidae, commonly known as "spined" or "thorny-backed eels," though not nearly related to the true eels, is "telliya," but the natives distinguish between the "Gang-telliya" (river-telliya), which is *Mastacembelus armatus*, and the "Batakola-telliya" (alluding to the lanceolate form of the body), which is *Rhynchobdella aculeata*. The latter is reputed to grow to a length of 15 inches, and I recently examined one of 12 inches. In the former, commoner species, the vertical fins are confluent and the dorsal spines are numerous (about thirty-eight); in the second species, which has not previously been recorded from Ceylon, the dorsal and anal fins are separated from the caudal by a notch above and below; the dorsal spines are less numerous (sixteen), and the long, fleshy snout, which gives these fishes such a remarkable, antiquated appearance, is transversely ribbed below. The identification is therefore not open to doubt.

The Rhynchobdellidae, as a family, are "excellent as food," to quote the words of the late Dr. Francis Day, and the hitherto unsuspected presence of an important member of the family in Ceylon affords an illustration of the incompleteness of knowledge concerning the biological conditions of the local inland fisheries. The Batakola-telliya is stated to be absent from Malabar, a peculiarity of distribution which ranges it roughly in the same category with *Channa orientalis*, *Polyacanthus signatus*, and perhaps a few other fresh-water fishes.

ARTHUR WILLEY.

Colombo Museum, January 20.

Poseidonius on the Originator of the Theory of Atoms.

IN Strabo's "Geography," book xvi., chapter xi., § 24, in the description of Sidon, we find the following remark:—

"If we are to believe Poseidonius, the ancient opinion about atoms originated with Mochus, a native of Sidon, who lived before the Trojan times."

This tracing of the theory of atoms to an authority

NO. 1998, VOL. 77]

much more ancient than Democritus does not seem to be mentioned in any of the works on physics, but as it is from the usually accurate Strabo, and rests on the high authority of Poseidonius, it seems worthy of notice.

T. J. J. SEE.

Naval Observatory, Mare Island, California,

January 27.

AGRICULTURAL AND HORTICULTURAL RESEARCH.¹

NO better evidence can be adduced of the growing interest in agricultural education and research in this country than the support which has been given to them by the county councils of Surrey and Kent during the last few years. They have materially promoted the science of agriculture and horticulture by furnishing the necessary means for the annual publication of such valuable reports as the one which

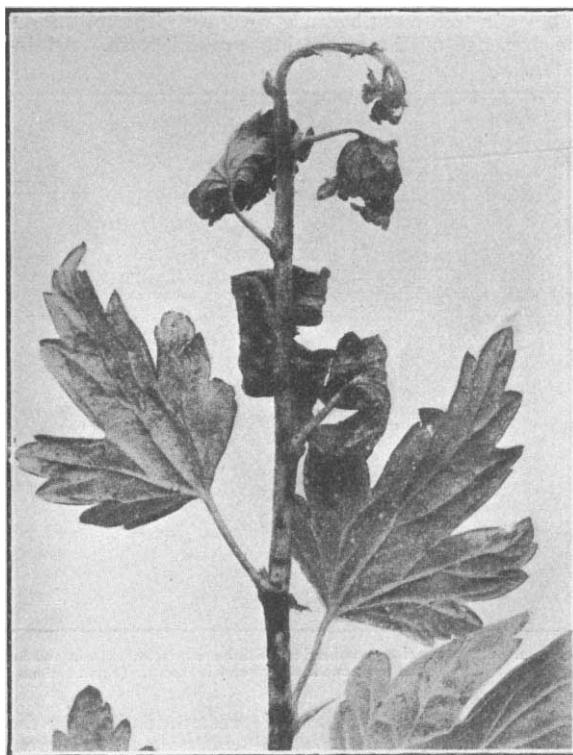


FIG. 1.—Gooseberry shoot attacked by the American Gooseberry-mildew. Numerous dark scurfy patches of the spawn of the mildew can be seen on the stem.

has recently been issued from the South-eastern Agricultural College at Wye, Kent.

The report gives the results of an immense amount of painstaking investigation, and the exhaustive way in which the subjects are treated will be appreciated when it is realised that a bulky volume of 438 pages has been produced by the combined labours of the various members of the staff. The work is well written, and the different subjects are presented with pleasing freshness. Altogether we feel that it will prove a veritable mine of immensely valuable information, enhanced in no small degree by some of the most beautiful half-tone illustrations which we have yet seen in a work of this kind.

¹ University of London. "The Journal of the South-eastern Agricultural College, Wye, Kent." No. 16. Pp. ix+428. (London and Ashford, Kent: Headley Brothers, 1907.) Price 6s.; for Residents in Kent and Surrey, 3s.

Apart from the research work connected with the college, we gather that an increasing use is made of this institute "as an advisory centre on matters relating to agriculture and horticulture, so much so that in future years each department of the work of the college will have its special journal." In the section devoted to the report of the economic zoologist, Mr. F. V. Theobald, no less than 119 pests are dealt with, chiefly under the following heads:—those injurious to man's domestic animals, to fruit trees, to pulse, hops, and vegetables, flowers, forest trees, food-stuffs, and those causing annoyance to man; and beside these are some replies to Extra-British inquiries. One of the more interesting portions, issued from this department, is that dealing with the habits of the woolly aphis (*Schizoneura lanigera*). The author has conclusively proved that the damage done by the root form of this pest is much more severe in this country than has been generally supposed. In view of this, Mr. Theobald attributes the failures in treatment because we have hitherto ignored the presence of the migrating ground form. An in-

energy in turning his extensive knowledge of fungi to practical account for the benefit of fruit growers in this country. The detection of the outbreaks of American gooseberry mildew (*Sphaerotheca mors-uvae*) (Figs. 1 and 2) by him was followed by an energetic and tactful campaign to bring about the stamping out of the disease, and his efforts have been rewarded by the introduction of the Bill dealing with fungus attacks into the House of Lords. The Board of Agriculture and Fisheries has now made an order which may be cited as the Gloucestershire and Worcestershire (Gooseberry Mildew) Order of 1907. It came into operation on July 22. This constitutes the first legislative measure against fungus diseases put into force in this country. The fungoid disease of the gooseberry was discovered in the winter of 1906 in some commercial plantations in Worcestershire and Gloucestershire, but it had previously been introduced into Ireland on diseased stock imported from America. It is during the so-called "summer stage" that this mildew spreads most rapidly, as at this period the chains of Conidia are produced in

continuous succession day and night. We gather that the cherry orchards in certain portions of Kent are still seriously affected by the fungus *Gnomonia erythrostoma*, which depends "absolutely for the continuance of its existence on fresh infection taking place in spring by means of the spores scattered from the fruit-conceptacles of the fungus on the dead leaves hanging on the tree." R. N.

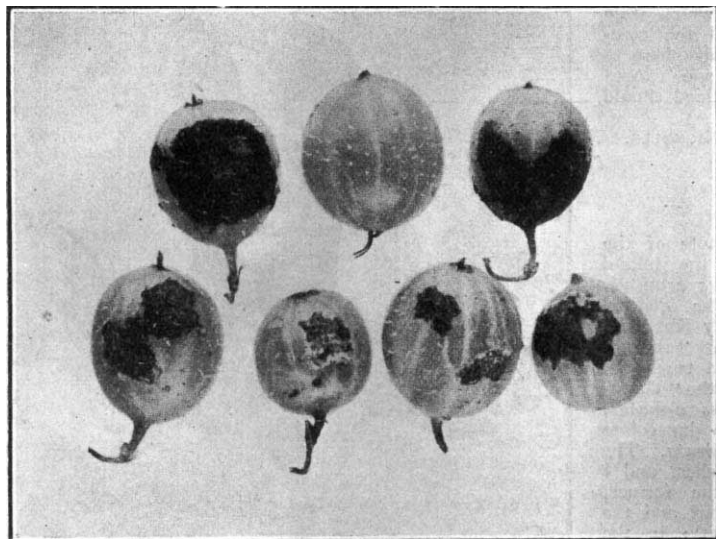


FIG. 2.—Six nearly ripe gooseberries which have been attacked by the American Gooseberry-mildew; one healthy berry is shown. (From Ireland.)

jection of carbon bisulphide is recommended for the terrestrial, and a caustic alkali wash for the arboreal form. In a short note on the habits of the house fly (*Musca domestica*), this insect is said to "have bred largely in rotting cow-dung mixed with vegetable matter." We may add, however, that in one of our largest cities, stable middens and ash-pits form the chief breeding places for this fly; anything in the form of decayed vegetable matter, such as the dung of pet animals, vegetables, or even paper, provides food for the larvæ, and more especially so where heat is engendered.

Messrs. H. E. Annett, F. V. Darbishire, and E. Russell furnish the report from the analytical laboratory, in which it is stated that 250 samples of various substances were sent in for analysis during the past year. A detailed account is given of some of these; others are dealt with briefly. They are treated under the following heads:—Manures, feeding-stuffs, poisons, milks, waters and soils.

The reports from the botanical department are contributed by the four members of the staff. Mr. E. S. Salmon, the mycologist, has given evidence of his

THE GEOLOGY OF THE TRANSVAAL.¹

THE most interesting features of the report of the Transvaal Geological Survey for the year 1906 are the excellent pieces of detailed mapping of the rocks of the Transvaal System, in the Lydenburg district, between Lydenburg and Belvedere, by Mr. A. L. Hall, and in the area immediately east of the Crocodile River and south of the Rooiberg by Mr. W. A. Humphrey. These two districts form parts of the same great synclinal trough; but while the Lydenburg district is at the eastern

end of the trough, and is as remarkable for the simplicity of its geological structure as it is famous for the grandeur of its scenery, the area mapped by Mr. Humphrey lies 200 miles to the west and nearer the centre of the trough, and is characterised by an exceptionally complicated structure. Surrounded by the much later Red Granite formation, the isolated inliers of the Transvaal System in the latter area owe their position to faulting and folding on a large scale, an adequate explanation of which can only be forthcoming when the area to the west is mapped in detail.

In both districts the three members of the Transvaal System are developed—namely, the Pretoria Series, the Dolomite, and the Black Reef Series. The quartzites of the Black Reef Series, which form the lowest division, attain to an unusual development in the northern part of the Lydenburg district, where they form the main portion of the great escarpment of the Drakensberg, and play a considerable rôle in determining the wild character of the scenery.

¹ Transvaal Mines Department. Report of the Geological Survey for the Year 1906. (Pretoria, 1907.) Price 7s. 6d.